

REMARKS/AMENDMENTS

I. Introductory Remarks.

The Applicant respectfully thanks the Examiner for the telephone conference call on 2 May 2006 and his comments in the Office Action mailed 18 January 2006. This paper addresses the issues raised in the Office Action mailed 18 January 2006 and the discussion on 2 May 2006 with the Examiner regarding the non-obviousness of Applicants invention. Claims 1-20 are currently pending in the application. In the Office Action of 18 January 2006, the Examiner rejected Claims 1-14 and 18-20. Claims 15-17 were withdrawn from consideration. Specifically, Claims 1-4, 7-14 and 18-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chino et al. or Miyakuni et al. as evidenced by Demmin. Claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chino or Miyakuni, and further in view of Hayasaka et al.

Claims 1 and 18, which are the independent claims, are herein amended to better encompass the full scope and breadth of the present invention, notwithstanding the Applicants' belief that the claims would have been allowable as originally filed. Reconsideration of the present application in light of the foregoing amendment and following remarks is respectfully requested.

II. Rejection of Claims 1-4, 7-14 and 18-20 under 35 U.S.C. §103(a).

Claims 1-4, 7-14 and 18-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chino et al. or Miyakuni et al. as evidenced by Demmin. Claims 1 and 18 have been amended to incorporate the selectivity of the etching process to produce vertical sidewalls in X and Y crystalline directions in a compound semiconductor material having a variable thickness, whereby the etching process is limited to the compound semiconductor material. Chino or Miyakuni do not teach the ability to etch vertical sidewalls in a compound semiconductor material that has a large thickness variation across it, nor the ability to prevent front-side metal punch through.

The currently amended Claims 1 and 18, selectively etch the compound semiconductor material regardless of the thickness across the material, without punch through to the front-side metal layer. Neither Chino or Miyakuni teach the ability to dry etch a compound semiconductor wafer that has a variable thickness. In addition, the processes disclosed in Chino or Miyakuni are not selective enough to prevent punch through of the front-side metal layer, as evidenced by Chino and Miyakuni each requiring an etching stopper layer to prevent punch through.

An etching stopper layer is not required in Applicant's invention, despite the fact that the compound semiconductor material may have a thickness differential across it. The Applicant's claimed process is selective enough to etch the backside of the wafer faster than the front-side metal layer, thereby preventing the front-side metal layer punch through, even with material thickness variations across the wafer.

The Examiner concedes that the current claims in Applicants invention differ from the prior art by specifying various processing parameters. The rejection based on combining Demmin to evidence that the same result-effective variables are commonly determined by routine experiment fails because the prior art cited, Chino or Miyakuni, never teach the claimed process. Applicants invention is unobvious in view of Demmin given that the selective etching processes in Claims 1-4, 7-14 and 18-20 are not obvious in Chino or Miyakuni. Therefore, Demmin cannot be used in combination with Chino or Miyakuni, since Chino and Miyakuni fail to teach Applicants invention. Therefore, the Applicants respectfully request that this ground for rejection on this basis be withdrawn and that Claims 1-4, 7-14 and 18-20 be passed to allowance.

III. Rejection of Claims 5 and 6 under 35 U.S.C. §103(a).

Claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over

Chino or Miyakuni as applied to Claims 1 and 3 above, and further in view of Hayasaka et al.

As discussed elsewhere in these remarks, Chino or Miyakuni fail to teach a dry etching process for producing vertical sidewalls in X and Y crystalline directions along a compound semiconductor material having a variable thickness, without punch through to the front-side metal layer by using halogen etchant in combination with nitrogen gas.

Hayasaka is used to show that it is a well-known feature in the art of semiconductor device fabrication that halogen-containing gas may be used for etching and that the halogen-containing gas can include chlorine, bromine, hydrogen bromide or hydrogen iodide. However, since Chino or Miyakuni fail to teach the Applicants inventive process, Hayasaka further in combination with the references does not attain the selective etching process as claimed by Applicant. Without the process being taught by Chino or Miyakuni, the fact that Hayasaka merely discusses use of halogen-containing gas in etching, does not render Applicants invention anymore obvious in view of Chino or Miyakuni. Therefore, the Applicants respectfully request that this ground for rejection on this basis be withdrawn and that Claim 5 and 6 be passed to allowance.

IV. Further Amendment Remarks.

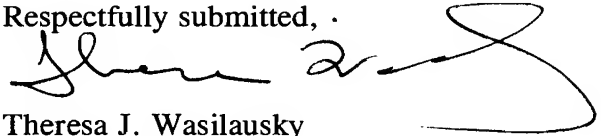
In light of the amendments to Claims 1 and 18, the rejections set forth in the pending Office action are rendered moot, and the Claims, as amended, remaining in this application are in a condition for allowance. Reconsideration of these rejections is respectfully requested. No new matter has been introduced by this amendment.

Claim 19 has been amended to correct for grammar. No new matter has been introduced by this amendment.

CONCLUSION

The Applicants would like to thank the Examiner again for the telephone conversation of 2 May 2006. Applicants respectfully request that Claims 1-14 and 18-20 as herein amended to better encompass the full scope and breadth of the present invention be reconsidered in light of the foregoing amendment and remarks, notwithstanding Applicants' belief that the claims would have been allowable as originally filed. Applicant reserves the right to file one or more continuation applications based on the above referenced application. The Examiner is further cordially invited to telephone the undersigned for any reason, which would advance the allowance of the pending claims.

Respectfully submitted, .



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Dated: May 18, 2006
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